

ATRIPLEX PACHYPODA (CHENOPODIACEAE), A NEW
SPECIES FROM SOUTHWESTERN COLORADO AND
NORTHWESTERN NEW MEXICO

HOWARD C. STUTZ

Department of Botany and Range Science,
Brigham Young University, Provo, UT 84602

GE-LIN CHU

Institute of Botany, Northwest Normal University,
Lanzhou, Gansu, China 730070

ABSTRACT

Atriplex pachypoda is a newly described annual species from southwestern Colorado and northwestern New Mexico. It occurs in alkaline seepage areas and adjacent disturbed slopes in La Plata county, Colorado, and Rio Arriba county, New Mexico. It is morphologically most similar to *A. caput-medusae* Eastwood, but differs in its smaller, more spreading habit, narrow-ovate to ovate-elliptical instead of deltoid-ovate leaves, flattened instead of uncompressed fruiting-bracts, small, cone-shaped, instead of large, flattened, fruiting-bract appendages, larger, central, marginal tooth of fruiting-bract, more stout fruiting-bract pedicel, and later flowering- and fruiting-periods.

This somewhat obscure annual species was first found 14 Aug 1991 at the south edge of Dulce, Rio Arriba County, New Mexico. Only two other populations have been found, one at the southwest edge of Bayfield, La Plata County, Colorado, the other in Dry Creek, north of highway 140, about 7 km west of Bayfield.

Atriplex pachypoda Stutz & Chu, sp. nov. (Fig. 1)—TYPE: USA, Colorado, La Plata Co., Dry Creek, ca. 7 km W of Bayfield, T34N R7W S12, 21 Sep 1995, *H. C. Stutz* 9822 (holotype, BRY).

Herba annua, 10–20 cm alta. Caulis erectus, ramosus; basales rami oblique ascendentes vel decumbentes, fere centrale caule aequilongi, tetragoni vel fere sic, plerumque leviter purpureorubelli, sparse furfuracei. Folia Kranz-typorum anatomiis, petiolata; lamina angusti-ovata, usque ovato-elliptica, 1–1.5 cm longa, 0.5–1 cm lata, apice obtusa vel breviter acuminata, basi cuneata, margine integra, costa conspicua, utrinque dense furfuracea, cinereo-viridis; petiolus 2–5 mm longas. Staminates et pistillati flores mixti in glomerulos, axillares ad totos ramos; perianthium staminalis floris globosum, ca. 1 mm diam. 4–5-partium; segmenta elliptica, apice leviter cucullata, membranacea, secus costam leviter carnosa et viridia; stamina 4–5, antheris ca. 0.3 mm longis, filamentis filiformibus ca. 0.5 mm longis. Fructiferae bractea transverso-oblongae, compressae, 4–5 mm lon-

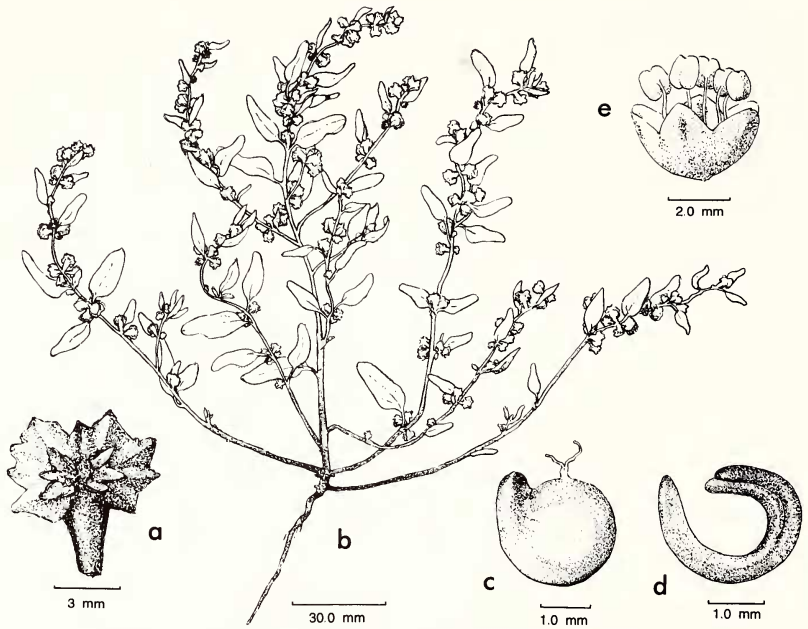


FIG. 1. *Atriplex pachypoda*. a. Fructing bract. b. Habit. c. Utricle. d. Embryo. e. Male flower. (Drawings by Marcus Vincent).

gae, 4–5 mm latae, margine irregulariter serratae, medio dente quam 2 contigui laterales dentes flerumque leviter minori, utrinque saepe aliquot irregulibus corniculatis appendicibus; stipes fructiferae bracteae validus, 2–3.5 mm longus, 1–2 mm diam. Utriculus ovatus, membranceo pericarpio. Semen flavo-brunnolum, ca. 2 mm latum, perispermio farinaceo; radicula supra. Chromosotum numerus $2n=18$.

Proxima *Atriplex caput-medusae* Eastwood, quae differt foliis deltato-ovatus usque rhomboideo-ovalis; fructiferis bracteis margine partitis.

Annual herb, 10–20 cm tall. Stem ascending, much branched, basal branches oblique, mostly decumbent, nearly as long as central stem, tetragonous or nearly so, usually slightly purple-reddish, sparsely furfuraceous. Leaves petiolate, petiole 2–5 mm long; blades narrow-ovate to ovate-elliptical, 1–1.5 cm long, 0.5–1 cm wide, apex obtuse or acuminate, base cuneate, entire, midrib conspicuous, densely furfuraceous on both surfaces, grey-green in color; Kranz-type anatomy. Male and female flowers in mixed glomerules, axillary throughout all branches; perianth of staminate flower depressed, globose, ca. 1 mm in diam., 4–5-parted; segments elliptical, slightly

hooded at apex, membranaceous, midrib slightly fleshy, green; stamens as many as perianth segments, anthers ca. 0.3 mm long, filaments ca. 0.5 mm long; rudimentary pistil present, punctiform. Fruiting bracts transverse-oblong in outline, 3.5–4 mm long, 4–5 mm wide, depressed, with stout, short stalk; margins irregularly denticulate, each marginal tooth with prominent vein to apex, middle tooth equal to, or slightly smaller than 2 contiguous teeth; usually with several irregular cone-shaped appendages on each surface; stalk of fruiting bracts 2–3.5 mm long, 1–2 mm wide. Utricle ovate, with membranaceous pericarp. Seed yellow-brown, ca. 2 mm broad; perisperm farinaceous; radicle superior. Flowering and fruiting period: August–October. Chromosome number: $2n=18$ (determined from aceto-carmines squashes of pollen mother-cells derived from anthers of staminate flowers fixed and stored in 5% acetic acid).

Paratypes. USA, Colorado: La Plata Co., Bayfield, T34N R7W S10, 3 Sep 1992, *H. C. Stutz 95696* (BRY); Bayfield, 17 Sep 1993, *H. C. Stutz 95937* (BRY); Dry Creek, 4 mi W of Bayfield, T34N R7W S12, 2 Oct 1993, *H. C. Stutz 95954* (BRY); SW side of Bayfield, 19 Oct 1993, *H. C. Stutz 95970* (BRY); Bayfield, 18 Aug 1994, *H. C. Stutz 9663* (BRY); Dry Creek, 15 mi E of Durango, 16 Aug 1995, *H. C. Stutz 9806* (BRY). New Mexico: Rio Arriba Co., Dulce, S edge of town, T31N R2W S35, abundant, 14 Aug 1991, *H. C. Stutz 95586* (BRY); Dulce, S edge of town, scarce, 8 Sep 1994, *H. C. Stutz 9667* (BRY).

Taxonomic relationships. *Atriplex pachypoda* appears to be most closely related to *A. caput-medusae* but differs in several significant characteristics including smaller stature (10–20 cm vs. 20–30 cm), narrow-ovate to ovate-elliptical leaves (5–10 mm wide, 10–15 mm long), instead of rhomboid-ovate to deltoid-ovate leaves (15–20 mm wide, 10–25 mm long) (Fig. 2) and flattened instead of uncompressed fruiting-bracts (Fig. 2). Fruiting-bracts of *A. pachypoda* have dentate margins and a few lateral cone-shaped appendages, whereas fruiting-bracts of *A. caput-medusae* have irregularly parted margins and bear numerous lateral, flattened appendages (Fig. 2). The central marginal tooth of *A. pachypoda* is nearly as large as the contiguous marginal teeth whereas, in *A. caput-medusae*, the central tooth is minute and obscured by much larger contiguous teeth. Both *A. pachypoda* and *A. caput-medusae* have fruits with conspicuous pedicels, but pedicels of *A. caput-medusae* are elongate (5–6 mm) and narrow, tapering from ca. ½ mm to ca. 1 mm in diameter whereas those of *A. pachypoda* are shorter (2–4 mm), and more massive, tapering from ca. 1.5 mm to ca. 2.0 mm (Fig. 2). Anthesis in *A. caput-medusae* is in early spring (May–June); anthesis in *A. pachypoda* is in late summer (August–October). Both *A. pachypoda* and *A. caput-medusae* are diploids ($2n=18$) (determined from aceto-car-

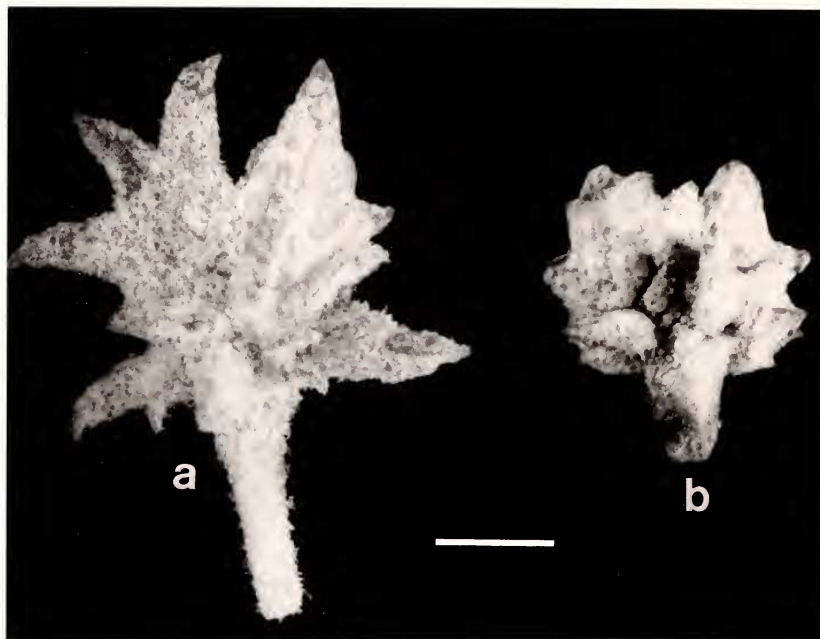


FIG. 2. Fruiting bracts of *Atriplex caput-medusae* (left) and *A. pachypoda* (right). Bar = 3 mm.

mine squashes of pollen-mother-cells taken from anthers fixed and stored in 5% acetic acid).

Distribution and habitat. *Atriplex pachypoda* has been found in only three localities: southwest side of Bayfield, LaPlata county, Colorado, along Dry Creek, about 7 km west of Bayfield, and at the south outskirts of Dulce, Rio Arriba county, New Mexico. Several intensive searches have been made throughout southwestern Colorado and northwestern New Mexico but no other populations have yet been found. However, because plants were abundant in the population at Dulce, New Mexico, in 1991 but scarce or absent in 1993 and were sometimes abundant and at other times scarce, at Bayfield, Colorado, other populations may yet be found when climatic conditions are favorable for their growth.

The three known populations of *A. pachypoda* are in raised areas near alkaline seepage areas. No *A. pachypoda* plants were found in the wet bottoms of these seepage areas but were plentiful on slightly elevated terrain within the seepages, and on the shoulders of nearby roadcuts.

Associated species. *Atriplex pachypoda* sometimes occurs in small, pure stands usually covering areas of less than 5.0 m² with

no other associated species but is often accompanied by plants of *Atriplex powelli* Watson, *A. subspicata* Rydberg, *A. heterosperma* Bunge, *Chrysothamnus nauseosus* (Pallas) Britt, *Distichlis spicata* (L.) Greene and *Polygonum* sp.

Phenology. Flowering and fruiting is mostly in late summer (August–October). Plants of *A. pachypoda* and *A. caput-medusae* grown in greenhouses and nurseries at Brigham Young University, Provo, Utah, from seed collected from plants growing in natural populations showed the same distinctive attributes expressed by plants growing in nature, indicating high heritability of these characteristics.

ACKNOWLEDGMENTS

We thank BHP-Minerals and Brigham Young University for financial assistance, and the curators of the following herbaria for loans of specimens and access to their collections: BRY, CAS, GH, NY, RM, RSA, UC, UNM, and US.

NOTEWORTHY COLLECTIONS

BRITISH COLUMBIA

SILENE SPALDINGII Wats. (CARYOPHYLLACEAE).—Tobacco Plains, vicinity of Roosville, between Davis Rd. and the Canada-U.S. border on Beau West Ranch, UTM 6412 54296, elev 850 m, on disturbed grassland with *Lupinus sericeus*, *Hypericum perforatum*, *Castilleja tenuis*, and *Castilleja thompsonii*, 8 Aug 1995, Michael T. Miller, verified by G. A. Allen (UVIC).

Previous knowledge. This rare campion is known from about 70 localities in Washington, Oregon, Idaho and Montana (B. Heidel, personal communication). The newly reported population (with an estimated minimum size of 100 plants) is 0.6 km N of the U.S. border, and approximately 1.3 km NE of the nearest documented occurrence in Flathead Co., Montana. We thank George Douglas of the B.C. Conservation Data Centre and Bonnie Heidel of the Montana Natural Heritage Program for providing us with information on known and suspected occurrences of this species along the B.C.-Montana border.

Significance. First record for Canada, and the most northerly record for this species. It is not clear whether the new record is the result of recent colonization, or has been overlooked by previous collectors. The locality is approximately 7 km N of the Dancing Prairie preserve in Montana, which harbors probably the largest known population of *S. spaldingii*.

—MICHAEL T. MILLER and GERALDINE A. ALLEN, Department of Biology, University of Victoria, Victoria, British Columbia V8W 3N5, Canada.